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tive of benzene sulphonamide as a reagent for bromine and iodine, in the place of chlorine water. When metallic bromides or iodides are decomposed by this substance, in the presence of carbon disulphide or chloroform, the solvents are colored, as they are when chlorine water is used. The substance is very stable and the reaction is extremely delicate.

Kremers has studied the effects of solvents upon the rotatory power of limonene. In some cases, as the dilution increases, the rotatory power of the limonene diminishes. He also found that limonene monohydrochloride, when in contact with water in a sealed tube, was slowly charged to terpin hydrate.

By the action of bromine on metanitriline, Wheeler obtained a substance in which the bromine is in the ortho position to the amido group. The nitro group influences the substitution in this case, for if aniline is treated with halogens, para and not ortho compounds are obtained. A number of derivatives of metanitriline were made and studied. A review, of recent articles on the dissociation of electrolytes as determined by experiments on solubility, is contributed by Humphreys.

J. ELLIOTT GILPIN.

SOCIETIES AND ACADEMIES.

NEW YORK ACADEMY OF SCIENCES, BIOLOGICAL SECTION, NOVEMBER 11, 1895.

THE following papers were presented:

Prof. H. F. Osborn: 'A Memorial Tribute to Prof. Thomas H. Huxley.'

Dr. Bashford Dean: 'Notes of the Ancestral Sharks.' In this paper Cladoselachids were reviewed, and for the first time the structural characters of their vertebral skeleton, integument and suspensorium were given; and together with these features was noted the lack of claspers, shown in a dozen well-preserved ventral fins, as significant of the fertilization conditions of these early sharks. In this regard these Lower Carbon forms would correspond to the usual ichthyic type (as of *Teleostome* or *Lung-fish*). The total absence of a pelvic girdle in these early forms is also significant.

Dr. Arnold Graf: 'A Peculiar Growth Char-

acter in *Crepidula*.' This paper recorded the adjustment of the shell of the *Crepidula* to that of a scallop, *Pecten*, the margin of the shell of the *Crepidula* conforming exactly to the ridged character of the shell of its host.

BASHFORD DEAN,
Recording Secretary.

THE TORREY BOTANICAL CLUB.

AT the regular meeting of the Club held on Tuesday evening, November 12. Prof. Emily L. Gregory, Ph. D., of Barnard College, presented an historical sketch of the *Theories of the Origin and Nature of the Starch Grain*, the relations of our present views concerning the nature of growth of organized matter to these theories being specially dwelt upon.

The systematic study of the subject began with Nægeli, and all subsequent contributions were either based upon his conclusions or took them for the starting point. He recognized the two substances, starch-cellulose and granulose as composing the starch grain, and described the phenomena of the appearance and disappearance of the latter and the transportation of its substance. He referred its origin to the chlorophyll-grain. Schimper subsequently pointed out the existence of the two other bodies, leucoplastids and chromoplastids and traced relations between the former and the starch grain. In all work up to and including that of Schimper, the accepted distinctions between unorganized and organized matter were such that the starch grain was taken as the type of the latter, and Schimper denominated it as crystalloid substance; that is, one which, though really organized, resembles a crystal in some particulars. Observations of the phenomena of the starch grain thus became the basis for theories concerning the growth of organized substances, of which the starch grain was taken as the type. Recently, however, Meyer has published a work reviewing the subject, and demonstrating, apparently, that it is not a crystalloid, but a true crystal, hence unorganized; so that all theories of the growth of organized substance, based on our ideas of the starch grain fall, and we must begin to study the subject *de novo* if Meyer's views are correct.

H. H. RUSBY, *Rec. Sec.*

NATIONAL GEOGRAPHIC SOCIETY, REGULAR
TECHNICAL MEETING, WASHINGTON,
D. C., FRIDAY EVENING, NOVEMBER 15.

The meeting was devoted to the discussion of the subject of the hydrography of the United States, in which five Government officers engaged in that work took part.

Mr. F. H. Newell, in charge of the Division of Hydrography in the U. S. Geological Survey, referred to the hydrographic work done by the Government through the agency of the Coast and Geodetic Survey, the Hydrographic Office, the Engineers' Office of the Army, and one or two other organizations, and pointed out the difference between that work and the work of the Geological Survey, the work of the organizations first named having reference in the main to the interests of commerce, while that of the last named Bureau is for the purpose of obtaining data of value relating to land irrigation, water power, and the supply of potable water. He then discussed in general terms the important work that the Geological Survey is doing in this line, with the small appropriation that it has for the purpose, and the methods followed.

Mr. Newell was followed by Prof. Willis L. Moore, Chief of the Weather Bureau, who outlined the objects and methods of the work of the flood-forecasting division of his Bureau in forecasting floods on the principal rivers, giving instances of how the people in certain regions had been warned of approaching floods, and how many lives and millions of property had thus been saved. He referred to the limited scope of the work, due to lack of funds.

Prof. Moore was followed by Mr. A. P. Davis and Mr. Cyrus C. Babb, both of the Geological Survey, in charge of stream measurements in the West and in the South and East, respectively. Mr. Davis stated the conditions which had governed the location and selection of gauging stations, mentioning State and private coöperation, necessitated by demands of economy, and describing the hydrographic basins, etc. Certain railroads and irrigation companies, he said, are making systematic stream measurements in the West. Two States, Kansas and Colorado, are coöperating by devoting a small sum of money to the work. Mr. Babb similarly

discussed the work done in connection with the streams of the Southern Appalachian region and on the Potomac. His work, which was begun but a few months ago, is the first of the kind yet done in the southern part of the country, and his paper was of particular interest.

The meeting closed with a paper by Mr. Marcus Baker, formerly of the Coast Survey, on the hydrography of the navigable waters, which was an interesting presentation of the subject from the point of view of navigation and commerce.

W. F. M.

GEOLOGICAL CONFERENCE OF HARVARD UNIVERSITY, NOVEMBER 5, 1895.

The Great Barrier Reef of Australia. By J. B. WOODWORTH. Mr. Woodworth spoke of the work of Mr. Saville Kent. A selection of about forty stereopticon views from the set of photographs of the great coral reef was shown. The views, it was pointed out, illustrated the way in which lowly-organized animals in coral seas take the place of plants, and even of inorganic debris on coasts like those of New England. The leafy alcyonarians grow attached to the bottom and act as the sea-weeds do in fending off the waves, and in harboring free crawling forms of marine life. The coral heads and blocks torn up by hurricanes take the place of boulders along the shore line. This reef further shows how great limestones, such as the Trenton and Corniferous of the North American palaeozoic sea, could have been made at no great distance from land. The great limestone-making zone is at sea level and a few feet below. The conditions now existing in the Great Barrier Reef, where islets and lagoons form, permit of the existence of land vegetation, and the record of various forms of shallow water and surface species in the midst of processes of limestone-making, which geologists have been accustomed to consider indicative of deep sea. It is now clear, as Dr. Murray has pointed out, that there are two great classes of marine calcareous deposits; those of the deep sea proper not developed in the continental areas, except locally, and those of a strictly continental type, of which the fossil reefs of the New York State system and the Great Barrier Reef of Australia are past and present examples.

Notes on Geological Excursions. By W. M. DAVIS. 1. A brief description was given of an excursion made on October 26th with a party from the Teachers College, New York City, up the Hudson River Railroad to Fishkill, and thence by electric car and on foot to the summit of South Beacon Hill (1635), near the northern margin of the Highlands. The evenness of the sky-line was a notable feature of the view then obtained, the successive ridges reaching a much more equable altitude than, for example, in the Highlands of Scotland; although both regions are regarded as ancient lowlands, reduced to moderate relief by long-continued denudation, afterwards elevated and dissected. The Highlands of the Hudson are now advanced well towards mature variety of form in the present cycle of denudation, the valleys generally following an Appalachian trend, northeast-southwest. The view included the trench cut across the Highlands by the Hudson, an admirable example of a narrow transverse valley draining a wide inner longitudinal valley; the deepening of the inner valley was permitted only as fast as the trenching of the transverse valley advanced, but the widening of the inner valley proceeded rapidly because the rocks there are relatively weak, while the transverse valley is still narrow, inasmuch as the rocks in which it is sunk are extremely resistant. The movement of elevation permitting the dissection of the Highlands paused before their present altitude was reached, as is indicated by a more or less persistent bench about 150–200 feet above the present river level, first brought to the writer's attention by Mr. Gilbert. West Point is on this bench.

2. Some account was given of a two-day excursion, November 2d and 3d, with a party of Harvard students to the district about Meriden, Conn., where the contact of basal Triassic conglomerates on ancient schists in the gorge of Roaring Brook, Southington, the two lava beds of the Meriden quarries, and the oblique 2000-foot fault from Meriden to Berlin, were examined. The evidence of two cycles of topographical development was reviewed from the summit of West peak (1007 feet) in the Hanging hills. The crystalline uplands on the east and west represent a peneplain of Jurassic-Cre-

taceous denudation, now uplifted and dissected by narrow valleys of adolescent expression; the broad floor of the Triassic lowland between the crystalline uplands represent a local peneplain of late Tertiary denudation, here and there interrupted by narrow lava ridges. The crest line of Totoket Mountain, next to the southernmost of the eastern lava ridges, is notable for its evenness. Mount Carmel and the Blue Hills, an ancient volcanic neck north of New Haven, rise somewhat above the level of the adjacent crystalline upland. The inland facing escarpment, or *inface*, of Long Island rose faintly on the southern horizon; the stripped lowland between its inner base and the crystalline old land being now submerged in Long Island sound. The glacial striæ ascending the north slope of the West peak lava ridge for at least a mile, now freshly revealed along the road lately made to 'Percival Park' on the summit, are commended to the attention of those who hesitate to believe that ice sheets can move up hill. (An account of the double lava bed of the Meriden quarries will appear in a forthcoming number of the American Journal of Science.)

ACADEMY OF SCIENCE, ST. LOUIS, NOV. 18, 1895.

THE Academy held its regular meeting at the Academy rooms, with President Green in the chair, and twenty-two members and visitors present.

Dr. Noah M. Glatfelter read a paper on 'The Relations of *Salix Missouriensis* Bebb, to *Salix Cordata*.' Dr. Glatfelter stated that *Salix Missouriensis* had been classed as a separate species by Mr. M. S. Bebb, but his own researches resulted in a different conclusion, his belief being that *Salix Missouriensis* was but a variety of *Salix Cordata*, and in some instances it was impossible for him even to detect the variety, the two being seemingly identical. Referred to the Council.

Mr. F. W. Duenkel presented a model of a meteorological instrument, invented by Mr. Leonard Hunt and himself, called 'The Electric Sunshine Annunciator,' and gave a brief explanation of its mode of operation, stating that it had been in use for a short time, but reported with accuracy the amount of sunshine each day.

A. W. DOUGLAS, *Recording Secretary*.